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मानक

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“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 3574-2 (2000): Organic Pigments for Paints, Part 2: Phthalocyanines [CHD 20: Paints, Varnishes and Related Products]



“ज्ञान से एक नये भारत का निर्माण”

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“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक

रंग रोगन के लिए जैवीय वर्णक — विशिष्ट

भाग 2 थाइलोसीनाइन

(पहला पुनरीक्षण)

Indian Standard

ORGANIC PIGMENTS FOR PAINTS —
SPECIFICATION

PART 2 PHTHALOCYANINES

(*First Revision*)

ICS 87.060.10

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

FOREWORD

This Indian Standard (Part 2) (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Raw Materials for Paint Industry Sectional Committee had been approved by the Chemical Division Council.

Phthalocyanine pigments have attained a distinct position in organic dyes for paints where clear tone, high light fastness and chemical inertness are required.

This standard was earlier published in 1966 to cater to certain specific requirements and to assist manufacturers to regulate the quality of production and consumers in selecting material of acceptable quality. The revised version takes into account the technological developments made during the last three decades. Also, few other varieties of organic pigments have been incorporated in the present version.

Part 1 of this standard covers specification for azopigments (toluidine red; chlorinated paraniotroaniline red; acrylamide yellows; and para red).

This standard contains clause 5.1 which calls for an agreement between the purchaser and the supplier.

The composition of the committee responsible for the formulation of this standard is given in Annex G.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

ORGANIC PIGMENTS FOR PAINTS — SPECIFICATION

PART 2 PHTHALOCYANINES

(First Revision)

1 SCOPE

This standard (Part 2) prescribes requirements, methods of sampling and test for phthalocyanine pigments used in paints and allied fields.

Name of Pigment	Crystal Modification	Remarks
Pigment Blue 15	Alpha	Solvent unstable
Pigment Blue 15.1	Alpha	Non-crystallizing
Pigment Blue 15.2	Alpha	Non-crystallizing, non-flocculating
Pigment Blue 15.3	Beta	Non-crystallizing
Pigment Blue 15.4	Beta	Non-crystallizing, non-flocculating
Pigment Blue 15.6	Epsilon	—
Pigment Blue 16	—	Metalfree phthalocyanine
Pigment Green 7	—	Chlorinated
Pigment Green 36	—	Partially brominated

2 REFERENCES

The Indian Standards listed below contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	Title
265 : 1993	Hydrochloric acid (<i>fourth revision</i>)
359 : 1965	Xylol, industrial solvent grade (<i>first revision</i>)
768 : 1982	Method for evaluating change in colour (<i>first revision</i>)
769 : 1982	Method for evaluating staining (<i>first revision</i>)
1070 : 1992	Reagent grade water (<i>third revision</i>)

IS No.

Title

1303 : 1983

Glossary of terms related to paints (*second revision*)

3493 : 1978

Methods of sampling and test for organic pigments for paints (*first revision*)

9788 : 1981

Titanium dioxide, rutile, for paints

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 1303 and IS 3493 shall apply.

4 REQUIREMENTS

4.1 General

The requirements prescribed in 4.2 to 4.4 is applicable to following phthalocyanine pigments:

4.2 Form and Conditions

The material shall be in the form of fine dry powder and free from grit or shall be in such a condition that it can be readily reduced to powder form by crushing under a pallet knife, without any grinding action. Low dusting type organic pigments, in the form of soft granules, may also be acceptable.

4.3 Composition

The material dried as prescribed under 6.1 of IS 3493 shall essentially consist of copper phthalocyanine or copper free phthalocyanine or polychloro/halogenated phthalocyanine. Presence of other ingredients, free from organic or inorganic colouring matter, incorporated during manufacturing process to improve pigmenting properties, constituting more than 5 percent of total pigment, by mass, shall be declared.

4.4 The material shall also conform to the requirements given in Table 1.

5 PACKING AND MARKING

5.1 Packing

Unless otherwise agreed between the purchaser and the supplier, the material shall be suitably packed in metal drums, hessian bags, plastic bags, plastic paper laminates, plastic woven sacks, paper bags, corrugated boxes with polyethylene inner liner.

5.2 Marking

The container shall be marked with the following information:

- a) Name of the material;
- b) Indication of the source of manufacture;
- c) Net mass of the material;
- d) Batch number/lot number in code or otherwise;
- e) Organic/inorganic colouring matter, percent by mass, if added (*see* 4.3); and
- f) Month and year of manufacture.

5.2.1 BIS Certification Marking

The product may also be marked with the Standard Mark.

5.2.1.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6 SAMPLING

The method of selection of representative samples of material and the criteria for conformity to the standard shall be as prescribed in 3 of IS 3493.

7 TEST METHODS

7.1 Tests shall be conducted as prescribed in IS 3493 and various annexures of this standard. Reference to relevant clauses of IS 3493 and annexures are given in col 4 and 5 of Table 1.

Table 1 Requirements for Phthalocyanine Pigments for Paints

(Clauses 4.4 and 7.1)

Sl No.	Characteristics	Requirement	Method of Test	
			Cl No. of IS 3493	Annex
(1)	(2)	(3)	(4)	(5)
A) PHYSICAL				
i)	Residue, (on sieve 325 mesh) percent by mass, <i>Max</i>	0.1	7	—
ii)	Volatile matter, percent by mass, <i>Max</i>	1.0	6	—
iii)	Matter soluble in water, percent by mass, <i>Max</i>	1.0	8	—
iv)	pH of aqueous extract	5-9, but within ± 1 percent of value of approved sample	8	—
v)	Oil absorption	30-50, but within ± 5 percent of value of approved sample	9	—
B) COLOURISTIC				
i)	Colour by visual assessment:			
a)	Transparency/opacity	Close match to the approved sample	10	
b)	Shade (hue)	do	10	—
c)	Dullness/brightness (chroma)	do	10	—
d)	Colour strength	Close match to the approved sample but within ± 5 percent of value of approved sample	11	—
ii)	Colour by spectro photometry ¹⁾			
a)	Lightness/darkness, dL	As agreed between purchaser and supplier but within ± 0.5 CIELAB UNIT		
b)	Dullness/brightness, dC	As agreed between purchaser and supplier but within ± 0.8 CIELAB UNIT		

Table 1 — Concluded

Sl No.	Characteristics	Requirement	Method of Test	
			CI No. of IS 3493	Annex
(1)	(2)	(3)	(4)	(5)
	c) Shade, dH	As agreed between purchaser and supplier but within ± 0.5 percent CIELAB UNIT		
	d) Colour strength	As agreed between purchaser and supplier but within ± 0.5 percent of approved standard		
	e) Total colour difference, dE	As agreed between purchaser and supplier but within 1-2 of CIE UNIT		
C) FASTNESS CHARACTERISTICS				
i)	Light and weather fastness	Not inferior to approved standard sample		A
ii)	Acid/alkali resistance	do		B
iii)	Heat resistance	do		C
iv)	Solvent fastness	do		D
v)	Resistance to crystallization and flocculation	do		E

¹⁾These characteristics may be tested, if specified by purchaser, to support visual assessment, using a suitable spectrophotometer.

7.2 Quality of Reagents

Unless otherwise specified, pure chemicals and distilled water (*see* IS 1070) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

ANNEX A

[Clause 7.1 and Table 1, Sl No. (C) (i)]

LIGHT AND WEATHER FASTNESS TESTS

A-0 GENERAL AND OUTLINE OF TESTS

Light and weather fastness of phthalocyanines largely depend on chemistry of pigment but influenced by physics of pigments such as crystal size, shape morphology, particle size distribution, etc. Resin binders also affect light and weather fastness of pigment. Natural weathering and light fastness experiment on pigmented coatings take very long time and call for specific geographic locations, direction and climatic conditions, etc. In view of long time taken, higher cost involved and great difficulty in optimizing ideal conditions, accelerated tests for light fastness and weather fastness test have been incorporated.

A-1 LIGHT FASTNESS

A suitable method for assessment of light fastness involves xenon arc based apparatus or similar equipments where fading of pigmented coating on

prepared panels (*see* Annex F) is assessed as per IS 768. Standardized and calibrated apparatus is run on panels for approx 400 h in absence of weathering forces and heat, dust, moisture, etc, in 1 to 8 steps to complete the cycle required for Blue Scale.

A-2 WEATHER FASTNESS

A suitable method for assessment of weather fastness involves testing on coated panels (*see* Annex F) under QUV weatherometer or similar equipment.

Standardized and duly calibrated QUV exposure is given on panels for 400 h, 600 h up to 4 000 h (as per end use requirement) to complete the weathering cycle. Weathering effect on panel is assessed against change of Shade on Grey Scale, as per IS 769 and reported on 1 to 5 rating scale, where 5 stands for outstanding and 1 stands for poor.

ANNEX B

[Clause 7.1 and Table 1, Sl No. (C) (ii)]

ACID AND ALKALI RESISTANCE TEST

B-0 OUTLINE OF THE METHOD

Resistance to acids and alkalis is determined by treating the material under test and the approved sample with dilute hydrochloric acid and dilute sodium hydroxide solution, respectively. The change in the colour and staining power of the material thus treated is compared with the change observed in the case of the approved sample, similarly treated, and tested against the original.

B-1 REAGENTS

B-1.1 Dilute Hydrochloric Acid

Dilute 6 ml of Hydrochloric Acid AR 35 percent (*see* IS 265) to 100 ml with water (*see* IS 1070).

B-1.2 Sodium Hydroxide Solution

10 percent (*m/v*).

B-2 PROCEDURE

B-2.1 Resistance to Acid

B-2.1.1 Carry out the test with approved sample and test sample simultaneously. Weigh 1.0 g pigment under test on a Whatman No.1 filter paper or equivalent (10 cm × 10 cm). Fold it (as shown in Fig. 1) then fold in another direction with the sides

overlapping and tie it with a string (keeping one end free and long) so as to enclose the pigment fully protecting it from coming out. Immerse the pigment packet so prepared, suspending at about the middle in 50 ml dilute hydrochloric acid taken in a Nessler's test tube of about 2.5 cm dia and 16 cm height. The extended string can be used for shifting and lifting the packet in acid. Close the test tube with a cork and maintain at room temperature for 24 h or in a water bath at 50°C for 2 h. Temperature and duration can be changed, as desired, depending upon mutually agreed requirements. Take out the pigment packet and shake the tube to make the acid solution uniform. Compare the colouration of bleed, if any, between the samples.

B-2.1.2 Wash the treated pigment in the packet with water till free of acid, dry at $100 \pm 2^\circ\text{C}$ in an oven. Test this dried pigment against the untreated pigment as prescribed in 10 and 11 of IS 3493 and compare the change with that obtained in the case of the approved sample when similarly treated and tested.

B-2.2 Resistance to Alkali

Repeat the test by taking dilute sodium hydroxide solution in place of dilute acid in the test method for resistance to acid.

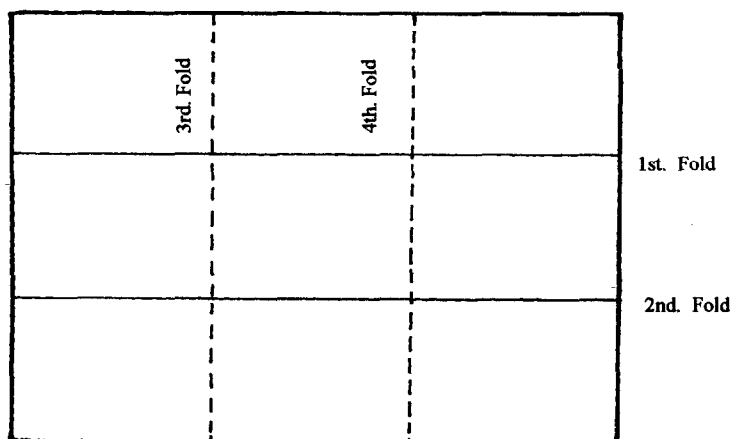


FIG. 1 FOLDING OF FILTER PAPER

ANNEX C

[Clause 7.1 and Table 1, Sl No. (C) (iii)]

HEAT RESISTANCE TEST**C-0 OUTLINE OF THE METHOD**

Heat stability of pigment is tested in short oil soya alkyd-butylated melamine formaldehyde resin stoving enamel which virtually does not yellow at stoving temperature up to 200°C. Heat stability of a pigment is that value of temperature up to which the pigment can be stoved for 30 min without undergoing any significant change in shade.

C-1 APPARATUS

C-1.1 Weighing Balance, of 1 mg accuracy.

C-1.2 Suitable Paint Making Machine

C-1.3 Automatic/Manual Bar Coating Machine, for 100 micron wet film.

C-1.4 Oven, with variable temperature setting.

C-1.5 Control Paint Panels

C-1.6 Spectrophotometer

C-2 PROCEDURE

C-2.1 The test shall be carried out on the sample dried as prescribed under 6.1 of IS 3493.

C-2.2 Sample pigment and standard pigment shall be dispersed at 4 percent pigment concentration (w/w of finished paint) in short oil alkyd medium in such a way that alkyd melamine ratio at 3:1 is maintained in finished paint. Xylene and butanol solvent combination shall be used as solvent. Finished paints of sample and standard pigment are applied with the help of bar coater. Flash off for 15 min in air and subsequently stoved at 100°C/30 min. Similarly the coated panels are stoved at different stoving schedules 120°C/30 min, 140°C/30 min, 160°C/30 min, 180°C/30 min, 200°C/30 min. These prepared panels are used for assessing heat stability of pigment as such and against its standard.

C-2.3 Determine the colour change, dE, spectrophotometrically using 100°C/30 min, paint panel as standard and paint panels at 120°C, 140°C, 160°C, 180°C and 200°C as samples. Temperature, at which dE exceed 3.00 CIELAB unit, is the temperature up to which pigment can withstand heat, without undergoing significant colour change. Heat stability can also be compared against standard by comparing dE values.

ANNEX D

[Clause 7.1 and Table 1, Sl No. (C) (iv)]

SOLVENT FASTNESS TEST**D-0 GENERAL**

The solvent fastness (for quality control purpose) is determined by the staining of a solvent mixture by the pigment sample. Solvent staining of sample and standard are compared and are recorded.

D-1 EQUIPMENTS

D-1.1 Folder Filter : 10 cm × 10 cm

D-1.2 Water Container Bath : 220 mm × 230 mm
× 200 mm

D-1.3 Test Tube Rack

D-1.4 Immersion Thermostat

D-2 REAGENTS

Solvent Mixture

Ethyl Acetate 30 percent

Ethylene Glycol 10 percent

Acetone 10 percent

Ethyl Alcohol 30 percent

Toluene 20 percent

100 percent

D-3 METHOD

Taking 0.5 g of pigment powder each from samples and standards are prepared into packets as in B-2.1 and immersed in Neslers test tube with 30 ml solvent mixture. The test tubes are sealed with corks and put in a water bath at 50°C for 120 min (alternatively, at room temperature for 24 h); then folded filters are removed.

D-4 EVALUATION

The staining of the solvent mixture of the sample and the standard is compared.

ANNEX E

[Clause 7.1 and Table 1, Sl No. (C) (v)]

RESISTANCE TO CRYSTALLIZATION AND FLOCCULATION TEST

E-0 Phthalocyanine pigments are directly responsible for loss of staining power or fading due to crystallization which may be accentuated by effects of other pigments or the medium used. To ascertain this property, the material is examined for change in crystal shape and size after refluxing with a strong solvent like Xylol. Further this property is tested by comparing the actual performance of a tinted enamel prepared from the material and an agreed medium with that prepared using the approved sample of the pigment and the same medium.

E-1 APPARATUS

E-1.1 Flat-Bottomed Flask, 250 ml, capacity.

E-1.2 Microscope

E-2 REAGENTS

E-2.1 Xylol, conforming to IS 359.

E-2.2 Titanium Dioxide, Rutile for Paints (*see* IS 9788).

E-2.3 Medium Short Oil Alkyd, dissolved in Xylol or any other medium as may be agreed to between the purchaser and the supplier.

E-3 METHOD FOR TESTING RESISTANCE TO CRYSTALLIZATION

E-3.1 Take about 0.5 g of the pigment in a 250 ml flask and wet it with about 50 ml of Xylol. Reflux the contents of the flask for 3h at 140°C in a glycerine or oil bath. At the end of this period, remove the flask from the bath and cool the contents. Place few drops of this slurry on a microscope slide. On the same slide, place few drops of the prepared sample with Xylol as a control. Examine the two patches under a microscope, at 400 times magnification. Observe the change in the crystal shape and size of the sample under test with the prepared sample.

Similarly note the change in the crystal structure and size of the approved sample when similarly treated.

E-3.1.1 Filter the remaining slurry of the treated sample through a filter paper and keep separately. Prepare a suspension of the prepared sample in Xylol and filter the suspension. Check the colour of this filtrate with that obtained after filtration of the treated sample and note bleeding, if any, of both the samples against that of approved samples when similarly treated.

E-3.1.2 Dry the residue obtained after refluxing with Xylol as prescribed in **E-3.1** on the filter paper in an oven maintained at $100 \pm 2^\circ\text{C}$ for 1h. Compare the staining power of the treated sample against that of the prepared sample by the method as prescribed in 11 of IS 3493. Determine the loss in the case of the approved sample treated similarly.

E-4 METHOD FOR TESTING RESISTANCE TO FLOCCULATION

Prepare a tinted enamel using the material and surface treated rutile titanium dioxide (**E-2.2**) in the proportion of 1:100 in the short oil alkyd medium (**E-2.3**) by grinding in a ball-mill or any other suitable equipment. After ensuring thorough grinding of the enamel, reduce it by addition of thinners to spraying consistency. Apply this enamel by spraying on mild steel panel. Rub one corner of the sprayed film with the finger just before it is surface dry. Allow the remaining portion of the material to stand for half an hour. At the end of this period stir the enamel and pour a small quantity over a portion of the sprayed film. Allow it to dry. Observe the difference in colour between the sprayed and rubbed portion of the enamel film with the area on which additional enamel was poured and compare the difference observed against that obtained in the case of the approved sample, similarly treated at the same time.

ANNEX F

(Clauses A-1 and A-2)

PREPARATION OF PAINTS AND PAINT PANELS FOR
LIGHT FASTNESS AND WEATHER FASTNESS TESTS

F-1 EQUIPMENTS

F-1.1 Paint Shaker

F-1.2 Stainless Steel Containers (dia 50 mm to 55 mm).

F-1.3 Glass Beads (2 mm to 3 mm).

F-1.4 Weighing Scale, 1 mg accuracy.

F-1.5 Drying Cabinet, up to 140°C.

F-1.6 Flow Cup, nozzle diameter, 4 mm.

F-1.7 Tapered Palette Knife, 100 mm blade × 100 mm handle.

F-1.8 Film Applicator 100 M.

F-1.9 Control Coater (K 101 type) with Bar No. 8 (100 μ wft).

F-1.10 Cellophane Tape Cutter

F-1.11 Graduated 10 ml Pipette

F-1.12 Stop Watch/Timer

F-2 MATERIALS

F-2.1 Titanium Dioxide, Rutile (*see* IS 9788).

F-2.2 Plain Long Oil Alkyd, 50 percent in mineral turpentine oil (MTO) with viscosity 17(+3) Poise at 25°C.

F-2.3 Short Oil Coconut Alkyd, 60 percent in xylene.

F-2.4 Butylated Melamine Formaldehyde, 60 percent in Butanol.

F-2.5 Xylene

F-2.6 *n*-Butanol

F-2.7 Dispersing Agent

F-2.8 Di-acetone Alcohol

F-2.9 Butyl Diglycol

F-2.10 Combination Drier

F-2.11 Antiskinning Agent

F-3 INTERMEDIATES/VEHICLE PREPARATION

F-3.1 Air Drying — Grinding Vehicle

Typical Composition	Percent by Mass
Plain long oil alkyd, 50 percent	60.00
Dispersing agent	1.00
MTO	39.00
Total	<u>100.00</u>

SPECIFIES : 30 percent solids

F-3.2 Air Drying — Let Down Vehicle

Typical Composition	Percent by Mass
Plain long oil alkyd (50 percent)	83.3
Butyl diglycol	3.5
Antiskinning agent	0.2
MTO	13.0
Total	<u>100.0</u>

SPECIFIES : 41-42 percent solids

F-3.3 30 Percent TiO_2 — White Air Drying Paint
(for Reduction)

Typical Composition	Percent by Mass
Mill base	
TiO_2 Rutile	30.00
Dispersing agent	1.00
Plain long oil alkyd (50 percent)	20.00
MTO	20.00
Let down	
Plain long oil alkyd (50 percent)	25.00
MTO	3.00
Butyl diglycol	2.00
Total	<u>100.00</u>

Dispersion less than 2 microns

F-3.4 Stoving — Grinding Vehicle

Typical Composition	Percent by Mass
Short oil coconut/soya long oil alkyd, 60 percent in xylene	60
Xylene	40
Total	<u>100</u>

SPECIFIES : 35-36 percent resin solids

F-3.5 Stoving — Let Down Vehicle

Typical Composition	Percent by Mass
Short oil coconut/ soya long oil alkyd, 60 percent in xylene	60.20
Butylated melamine 60 percent in butanol	32.80
Xylene	7.00
Total	<u>100.00</u>

SPECIFIES : 55-56 percent solids

F-3.6 Stoving — White 30 percent TiO_2 Paint for Reduction

<i>Typical Composition</i>	<i>Percent by Mass</i>
TiO_2 Rutile	30.00
Dispersing agents	1.00
Short oil soya alkyd, 60 percent	36.75
Melamine formaldehyde, 60 percent	12.25
Xylene	7.00
Butanol	3.00
Butyl diglycol	7.00
Diacetone alcohol	3.00
Total	100.00

Dispersion less than 2 μ

Pigment binder ratio, 1:1

Alkyd/melamine formaldehyde ratio, 3:1

F-4 TEST AUXILIARIES

F-4.1 Test cards	Chromalux of 300 gsm and of size 100 mm $\times$ 230 mm
For fullshade	45 mm wide transverse or 180 mm $\times$ 140 mm black stripe
For reduction	Without the black stripe

F-4.2 Nylon Cloth for Filtration**F-4.3 Cellophane Tapes****F-4.4 Rubber Tipped Glass Rod****F-4.5 Tin Coated M.S. Panel****F-5 PREPARATION OF REDUCTIONS***Percent Pigment Contents:*

<i>Full shade</i>	<i>Deep shade</i>	<i>Reduction shade</i>
4 percent conc	1:1 TiO_2 *	1:20 TiO_2 **
*Deep shade		(1:1 TiO_2) percent
4 percent full tone paint		88.25
30 percent TiO_2 white paint		11.75
Total		100.00
**Reduction shade		(1:20 TiO_2) percent
4 percent full tone paint		27.25
30 percent TiO_2 white paint		72.75
Total		100.00

F-6 PROCEDURE FOR AIR DRYING STOVING/PAINT PREPARATION FOR STANDARD/SAMPLE PIGMENTS

Standard organic pigment and sample organic pigment can be simultaneously converted into air drying paint/stoving paints by using Paintshaker dispersing equipment, as per following scheme.

F-6.1 Full Shade Paint Preparation Scheme

Weigh out as	4 percent Full Tone	5 percent Full Tone	8 percent Full Tone	10 percent Full Tone
Mill base pigment	3.6	4.5	7.2	9.0
Airdrying or stoving — Grinding vehicle	26.4	25.5	22.8	21.0
Total	30.0	30.0	30.0	30.0
Airdrying or stoving — Let down vehicle	60.0	60.0	60.0	60.0
Grand total			90.0	90.0
Dispersion time	45 min			
Equipment	Suitable paint making machine			
Dispersion	7-8 on hegman gauge			

F-6.2 Deep Shade Paint Preparation Scheme

Weigh out as	4 percent Full Tone			5 percent Full Tone		8 percent Full Tone	10 percent Full Tone
Colour TiO_2	1:1	2:1	4:1	2:1	4:1	4:1	4:1
Full tone paint 4:2	30.0	30.0	30.0	30.0	30.0	30.0	30.0
30 percent TiO_2 Airdrying paint/or stoving paint	4.0	2.0	1.0	2.5	1.5	2.0	2.5
Total	34.0	32.0	31.0	32.5	31.5	32.0	32.5

F-6.2.1 Mix in plastic beaker container using rubber tipped glass rod to give a homogeneous mixture.

F-6.3 Reduction Shade Paint Preparation Scheme

Weigh out as	4 percent Full Tone 1:20	5 percent Full Tone 1:20	8 percent Full Tone 1:20	10 percent Full Tone 1:20
Full tone paint	7.5	6.0	4.5	6.0
30 percent TiO_2				
Airdrying paint/ or stoving white	20.0	20.0	24.0	20.0
Total	27.5	26.0	28.5	26.0

F-6.3.1 Mix in plastic beaker/container using rubber tipped glass rod to give a homogeneous mixture.

F-6.4 Recommended Shade Depth for All Phthalocyanine Pigments

Full tone	4 percent Pigment
Deep tone	1:1 TiO_2
Reduction	1:20 TiO_2

ANNEX G

(Foreword)

COMMITTEE COMPOSITION

Raw Materials for Paint Industry Sectional Committee, CHD 21

<i>Chairman</i>	<i>Representing</i>
DR R. B. TIRODKAR	Asian Paints (India) Ltd, Mumbai
<i>Members</i>	
SHRI R. SRINIVASAN	Addisons Paints and Chemicals Ltd, Chennai
SHRI E. RAMANATHAN (<i>Alternate</i>)	
SHRI K. P. JAMBOTKAR	Asian Paints (India) Ltd, Mumbai
SHRI S. G. SHEVDE (<i>Alternate</i>)	
DR. S. M. A. HAMZA	Berger Paints (India) Ltd, Calcutta
DR. A. ROY (<i>Alternate</i>)	
DR R. K. JAIN	Central Building Research Institute, Roorkee
SHRI K. K. ASTHANA (<i>Alternate</i>)	
SHRI R. G. GANGULY	Coates of India Ltd, Calcutta
SHRI S. C. SRIVASTAVA	Colour-Chem Ltd, Mumbai
SHRI M. B. SATYANARAYANA	Continental Coatings Pvt Ltd, Chennai
SHRI A. S. SOOD	The Development Commissioner (SSI), New Delhi
SHRI SURESH YADAVA (<i>Alternate</i>)	
SHRI SHAISH KUMAR	Ministry of Industry, Department of Industrial Policy and Promotion, Government of India
SHRI N. R. NARAYANAN (<i>Alternate</i>)	
SHRI KARAM CHAND	Export Inspection Council of India, New Delhi
SHRI S. S. ANAKAIKAR	Goodlass Nerolac Paints Ltd, Mumbai
SHRI A. E. PANHALE (<i>Alternate</i>)	
SHRI R. BEHL	ICI India Ltd, Calcutta
SHRI G. C. JADHAV	Indian Paints Association, Mumbai
SHRI D. K. ROY (<i>Alternate</i>)	
REPRESENTATIVE	
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Amendments Issued Since Publication

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